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SPECIFICATION AND

SCHEDULE OF WORKS

FOR

STONE REPAIRS & PAVING IMPROVEMENTS

AT

COLSTERWORTH WAR MEMORIAL

FOR

COLSTERWORTH AND DISTRICT PARISH COUNCIL

3501/ EP
July 2021- Rev A

FORM OF TENDER

For: STONE AND FABRIC REPAIRS

At: THE COLSTERWORTH WAR MEMORIAL

For: THE COLSTERWORTH PARISH AND DISTRICT COUNCIL

I/We having examined the Specification and Schedule of Works together with the drawings numbered 3501/001, 3501/002A, 3501/101A, 3501/102A, 3501/103A & 3501/104 and having visited the site, do hereby offer to provide all plants, materials and labour necessary to execute the whole of the works for the sum of : £_____ (£_____) plus VAT if applicable.

The Tender is on a fixed price basis and is open for acceptance for a period of four months. We understand that the lowest of any Tender will not necessarily be accepted and no allowance will be made for the preparation of Tenders. The work will be completed within _____ of the date of possession and I/we undertake to execute with you a Form of Contract embodying all terms and conditions contained in this offer. Earliest starting date if appointed: _____.

Dated this _____ day of _____ 2021

Signed: _____

For: _____

PART 1 PRELIMINARIES

1. Scope of the works

The works comprise of making repairs to the defective stonework of the base plinth of the Grade II listed Colsterworth War Memorial, including the application of a protective sheltercoat to the top cross and improvements to the surrounding paving.

All to be detailed further in Part 3 of this document.

2. Site and Access

The War Memorial in Colsterworth is a Grade II listed monument located at a widening by the High Street B 6403, which crosses the village in the axis of N-S and before this meets at the crossing further south with Stainby/ Bourne Road B676. It was built to commemorate the fallen at the two World Wars.

The memorial is situated on a grassed island which can be accessed all around by a vehicle. There is sufficient land for setting up the site, but it is recommended that the Contractor visits the site while preparing their tender to ascertain fully access conditions and any possible restrictions. No claims for additional costs arising from a lack of knowledge in this regard will be allowed under the terms of the contract.

3. Restrictions upon working

Work should take place only during normal working hours as the monument is surrounded by residential properties which should not be disturbed outside normal working hours.

4. Insurance

The Contractor will provide minimum £2,000,000 Public Liability Insurance cover.

5. Security

The Contractor will take all necessary steps to secure the working area so that no vandalising or any other damage to the monument shall take place during the works.

6. Payments and Contract

The Contract will take the form of RIBA Concise Building Contract 2018/ JCT Minor Works 2016.
Payment will be made on completion of the work. The Architect will certify when the works have been completed. There will be a retention of 2.5% of the contract sum for 12 months from completion, where the Contractor will remain responsible for putting right any defective workmanship discovered during this period.

7. Sanitary and welfare accommodation

Sanitary and welfare accommodation will be the responsibility of the Main Contractor. There are no sanitary facilities available on site. Other facilities might be available subject to agreement with the Client. The Contractor will be responsible for fencing and security of the provided facilities as they may deem necessary.

8. Scaffolding, plant and materials

The Contractor will supply all necessary plant, tools and materials for the proper execution of the works.
All materials will be of the quality specified in the applicable specification issued by the British Standards institution.

9. Storage of materials and equipment

Any materials and plant stored on site remain the responsibility of the Contractor, who shall provide all the necessary fencing and security for theses as deemed necessary.

10. Water and Power

Water and Power are not available on site and the Contractor should make his own provisions for their supply.

11. Fire Safety

Smoking is not to be permitted inside the working site. A dedicated smoking area can be provided away from the monument and in agreement with the Client.

12. Safe Working

The Contractor will comply with all relevant Health and Safety Legislation. For the purposes of the CDM Regulations the Contractor will be deemed to be 'the Principal Contractor' and will include in his tender all plant, scaffolding and work that will be required to carry out the contract in a safe manner.

At this stage it is assumed that the works will not be notifiable.

Where relevant, the Contractor will take all necessary measures to maintain the safety of the public and road-users during the works, and for carrying out all necessary liaison with the Highway Authority in this regard.

13. Site Inspection

The Contractor is to visit the site during the preparation of his tender and acquaint themselves with the site, accessibility, services, local conditions and assess the full extent and character of the work. They shall be deemed to have satisfied themselves with regards to existing conditions, the risk of injury or damage to property, and generally to have obtained their own information on all matters affecting the execution of the works. No variation or additional payment will be considered on the grounds of lack of knowledge of the works, lack of information, deficiency of description, or occasioned by any default of inspection on the part of the Contractor.

14. Cleaning the Site

The Contractor will clear away all plant, protection and equipment at the end of the contract. The Contractor will make sure that the site is left clean and tidy and that all waste material is removed and properly disposed of.

PART 2 SPECIFICATION

STONEWORK & LIME MORTAR

Sand

The sand shall be clean, angular, sharp, grit sand blended with soft sand only for the purpose of achieving a colour tint, and free from all impurities.

Generally, grading limits will conform to BS EN 13139:2002. Unless otherwise specified in the detailed specification given hereinafter, aggregate ratios for mortar should be as follows:

5.00mm	0%
2.36mm	10%
1.18mm	20%
600 micron	20%
300 micron	20%
150 micron	15%
fines	15%

A sample will be approved by the Architect before the Contractor orders in bulk for the works.

Crushed Stone

If called for in the detailed specification this will be a high porosity limestone aggregate (typically Portland or Guiting stone) graded at 1.18mm and should form part of the total aggregate ratios as shown above.

Water

Shall be clean from a main or other supply.

Natural Hydraulic Lime

(for repointing to paving and coping stones to Step 1 plus steps 2 & 3 if disassembly required)

Mortar shall be natural hydraulic lime from the St Astier quarry NHL 3.5.

Repointing mortar mix to be: 1: 2.25: 0.25 NHL 3.5 to well graded sand to graded crushed stone, the total aggregate ratio to comply with the percentages as mentioned above.

Lime and aggregate must be thoroughly mixed together with the minimum amount of water required to achieve binding. The mortar should be placed in a mechanical mixer and mixed for not less than 25 minutes before use. For best workability, the mixed mortar should be placed in a sealed bin for the following periods before being remixed ready for placement:

NHL 2	4-12 hours (overnight is ideal)
NHL 3.5	2-4 hours
NHL 5	1-2 hours

No portion of the mortar shall be used after the following periods have elapsed from first mixing with water:

NHL 2	48 hours
NHL 3.5	24 hours
NHL 5	12 hours

Non-hydraulic Lime Putty Mix

(for repointing Step 1 side elevations, bedding to all stones and mortar repairs to base plinth)

Putty should be non-hydraulic lime slaked to putty and matured, this is usually available in plastic tubs. Powdered non-hydraulic Lime must not be used. All putty should have a bulk density of at least 1.35kg/l and have been matured for at least 3 months.

Putty from plastic tubs should have excess water drained before use. Lime putty should be mixed in a mortar mill preferably a roller pan mixer.

Bedding mortar mix to be:

1: 2.75 mature lime putty: well-graded sand with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 5% by volume of coarse stuff.

Repointing mortar mix to be:

1: 2.25: 0.5 mature lime putty: well-graded (yellowish-brown) sand: well-graded crushed stone with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 5% by volume of coarse stuff.

Plastic repair mortar mix to be:

1: 1.5: 0.5: 0.5 mature lime putty: well-graded (yellowish-brown) sand: fine staining yellow sand: well-graded crushed stone with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 10% by volume of coarse stuff.

All mixes will have to be prepared on site in advance for the Architect's approval before progressing with the repairs and any adjustments that might be required to the mix in order to provide a better match.

Pozzolans

Pozzolans if specified should only be added immediately before mortar use. This should be done by mixing them with water to form a slurry before blending in the coarse stuff. Once pozzolans have been added the mortar must be used within 2 hours.

Unless otherwise specified Ground Granulated Blast-Furnace Slag (GGBS) should be used as a pozzolanic additive, quantities as specified in the schedule.

Pointing

Unless otherwise specified hereinafter the joints should be raked out to 40mm depth taking care not to damage the soft arises of the stones. A flat bladed quirk tool is the preferred for this operation. The use of mechanical grinders will not be permitted without the express permission of the Architect. Clean out all joints to remove dust and loose debris and thoroughly wet with clean water before repointing. Completely fill all joints with fresh mortar and press well with an appropriate pointing iron to prevent voids occurring between new and old mortar. Deep joints and cavities are to be filled and compacted using a suitable ramming iron.

Fill joints solidly until they are flush with general wall face and strike off to remove any surplus. Before the final set takes place, finish off the joints with a dry stiff bristle brush using a beating action further to compact the joint and expose the aggregates. Upon completion the finished pointing is to be flat and generally flush with the stone face and free from all trowel marks such as lining-in. Where arises of the stones have weathered

away leaving rounded or broken corners and arises, the pointing is to be recessed to avoid exposed feathered edges.

Newly pointed joints must be protected for at least 7 days with wet sacking draped with polythene sheeting and re-moistened at approx. 3 hourly intervals throughout the day and before leaving site for the night.

No mortar should be laid when there is a risk of frost.

The Contractor must carry out a sample area of repointing for the Architect's approval minimum 1m² before any re-pointing work is started.

No admixtures of any kind are to be introduced into mortar mixes without the Architect's written consent.

Fracture repairs

Stone fractures where indicated on the drawings are to be repaired by filling these in with an injectable grout. The grout will consist of 1 part sieved lime putty to 2 parts trass as pozzolan. Any adjustment required to the colour in order to match the stone can be achieved by mixing some very fine sand and/or stone dust- a sample will have to be prepared and approved by the Architect before progressing with the repairs.
Aggregates and additives will have to be very finely sieved through a 600-micron sieve before mixing with the sieved lime binder, then the mortar thinned to a slurry with water.

Before applying the grout, prepare the fracture by removing any debris with dental tools and small blades and flush out the void with clean water or preferably with a 1:1 mixture of water and industrial methylated spirit or isopropyl alcohol. Grout the fracture using an appropriate syringe until the void is fully filled, then gently swipe with some cotton wool to remove any excess and provide a flush level surface. If any leaks occur, plug the area immediately with cotton wool. When the grout has set remove any cotton wools if used and clean the stone surface.

Dowel Cramps

Dowels and cramps are to be Delta Bronze, 'Staifix' stainless steel supplied by George Clark (Sheffield) Ltd or equivalent and approved.

New Stone to match the existing Clipsham

All replacement stone should be similar in colour, texture, physical, chemical and mineralogical properties to the original.
Before ordering new stone, the Contractor will submit a sample of the existing Clipsham stone to an approved laboratory for analysis. New stone will be selected to match the properties of the existing as closely as possible and will be obtained from a quarry to be approved by the Architect. Before an order is placed for the new stone, a sample must be submitted to the Architect for approval.
Today Clipsham Stone is extracted at Big Pits in Clipsham and Hooby Lane quarry near Greetham (Goldholme Stone Ltd). Alternatively, the quarry Stamford Stone Co Ltd at Bidwell Lane or Medwells at Oakham, Rutland, LE 15 7SE could be tried for a match.

Worked Stone

Exposed faces of all new stonework will be finished with a hand tool to provide a surface texture in keeping with the existing stonework. The finished texture of the stone will be decided by the Architect, but the intention will be to match unweathered areas of the original stone.

Setting Stones

Stones must be normally be laid on their natural quarry beds except for cornices and copings which are to be joint-bedded and arch stones and tracery which are to have their beds at right angles to the line of thrust. All beds are to be true and level and not hollow or convex.

All new and rebuilt stonework is to be correctly toothed, bonded and coursed to blend and marry exactly into the original stonework. Bonding stones are to be incorporated at suitable intervals where large areas of stonework are involved.

Replacement of Stone

Individual replacement stones are to be the same size, shape and face finish as the original stones would have been before becoming damaged or defaced.

Stones to be removed are to be cut out by means of a hammer and chisel, power tools are not to be used.

When cutting out stones care must be taken not to damage the arises of the adjoining stonework which is to be retained. Where original stones are to be taken out for rebedding great care will be exercised to avoid damage to faces and arises. No original stones are to be discarded, despite their condition, without the Architect's permission.

Where individual stones are to be replaced they are to be wholly and cleanly cut out for the full width of their bed or to a depth of not less than 125mm whichever is the lesser.

The mason will allow for tooling off the sharp arises on the replacement stone.

Mouldings and Carved Work

Replacement moulded and carved work whether worked in-situ or off site is to match the profile of the original stone prior to it becoming weathered or damaged and is to be carried out by competent craftsmen who will be responsible for taking their own site measurements and templates.

Protection of Carved Work

Protect all existing and new work from damage in vulnerable locations by covering up and remove as the scaffolding is lowered.

Masonry Anchors

All old iron cramps, dowels and other existing fixings which are exposed during the work are to be carefully cut out and replaced by similar phosphor bronze or stainless-steel fixings (austenitic grade 316 stainless steel complying with BS EN 10088-2:2014).

Cut all joggles grooves and pockets in stones for new masonry anchors and dowels as necessary and install anchors with a hydraulic lime grout.

Brushing Stonework

Where 'brushing' of stone is specified all dry flaking and friable material is to be removed by means of a dry natural bristle brush without the use of water.

Indent Repairs

Where called for in the detailed specification, stone indent repairs will comprise the following:

- Select and shape a new piece of stone that will mask the area of damage in the original stone with the minimum of cutting out beyond the damaged area. Allow a minimum depth of 50mm.
- Neatly cut out a socket to accept the new stone allowing 10mm bedding space to the rear. Where working on the edge of an existing stone, form a dove tail into the socket.
- Prepare the face of the new stone insert by tooling or rubbing on a coarse grit sand table to achieve a surface to match the existing stone. Take care to maintain arises undamaged.
- Insert the new stone with a coating of lime slurry (made from the specified bedding mortar mix by adding more water to the desired slurry consistency) on the mating faces and using the bedding lime mortar mix as specified herein applied to the back face. Press firmly into place so that the face of the new stone lines with that of the existing.
- Clean off surplus slurry, rub mortar into the stone / stone joint to fill any minor discrepancies and wash off with a light water spray.

Stone Tile Repairs

Where called for in the schedule of work, neatly cut out sufficient of the existing stone and until a healthy core is reached to a min. depth of 120mm to accommodate the new stone. Consolidate any voids with lime mortar. Original stone and new stone to be drilled to accept 150X 8mm stainless steel dowels set into the stones with epoxy mortar at max. 100mm centres. Lime grout (see the one for fracture repairs) is to be hand pumped to fill the voids and allowed to set and the joints pointed in a lime mortar as specified further above (repointing section). Final sizes to be agreed on site.

Tile Slip Repairs

Where called for in the detailed specification hereinafter, neatly cut out pockets of decay and infill by means of roughly cut tiles or stone slivers bound together with hydraulic lime mortar. On no account must the tiles or stone slivers be machine cut. In specified circumstances this repair will be finished with lime based render coat.

Plastic (Mortar) Repairs to Stone

Plastic repair mortar mix to be:

1: 1.5: 0.5: 0.5 mature lime putty: well-graded (yellowish-brown) sand: fine staining yellow sand: well-graded crushed stone with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 10% by volume of coarse stuff.

Total aggregate ratios for mortar repair should be as follows:

5.00mm	0%
2.36mm	10%
1.18mm	15%
600 micron	20%
300 micron	20%
150 micron	20%
fines	15%

Where specified in the detailed Schedule of Works, plastic repairs will comprise the following works:

- Clean out a pocket of decay to remove all perished and friable material.
- Break the surface of the background to create a key for the new mortar fill.
- Thoroughly wet the stone to reduce suction.
- Apply a lime mortar filling using the lime mortar mix as specified herein, pressed well into the pocket and left proud of the original stone face. The sand must be selected to achieve the best possible match with the surrounding stone.
- Moisten the repairs at 2 hourly intervals with a fine water spray during the working day and protect with wet hessian and polythene sheeting for a period of 3 days.
- After an initial set has occurred (approximately 48 hours in summer, 3 days in winter) carefully trim away the surplus mortar to achieve alignment with the surrounding stone and brush off with a churn brush.

Note: Pockets in excess of 15mm depth must be built up in layers not exceeding 15mm thickness, applied at minimum 24hr intervals. Each backing layer is to be cross-keyed. If the depth of the repair is to exceed 50mm, a suitable armature should be provided at least 10mm back from the surface of the repair in austenitic stainless steel, phosphor bronze or ceramic. Alternatively, the extra depth can be infilled with stone shards, which should be pre-wetted and rather flat to be set into a base coat of mortar without rocking.

SHELTER COAT ***(for Top Cross)***

The sheltercoat to be applied to the Top Cross shall be made from 3 parts lime putty mixed with 1 part fine stone dust and fine sand to achieve a good colour match with the stone to be coated. This mortar mix will need to be thinned down to a thin creamy consistency (slurry) with a 50/50 (3 and 3 parts) mixture of water/skimmed milk. This must be done no longer than one hour before it will be used otherwise the binding effect of the casein may be lost.

The Contractor should prepare a suitable mix applied onto stone as a sample for the Architect to approve before progressing further with these works.

All stone surfaces to be shelter coated shall be thoroughly prepared by de-frassing, gently brushing and washing free of any loose particles, dirt, lichen etc. An approved biocide should only be used if invasive species roots are detected or if there is persistent mould growth that cannot be removed with conservative cleaning methods as described above; the application of a biocide will only be permitted with the written consent of the Architect and that of the War Memorial Trust. Any deep voids should be filled in with a repair lime mortar as specified to provide a sound clean surface and after

agreement with the Architect on site. Every care should be taken not to alter the appearance of the carving.

Before applying the sheltercoat, the clean stone surface should be dampened well. The shelter coat is to be applied with a soft brush worked well into the surface and left to dry until it begins to turn matt. Then it must be tamped over with a dry bristle brush so that the shelter coat gets compressed into the stone pores. Once each coat is completely dry, any excess is to be removed with a stiff cloth, hessian or brush. This procedure should be repeated for minimum 5 coats with 24 hours between coats. The aim should be to fill the pores of the stone surface without leaving an overall coating onto it. Before progressing with the application of a further coat, the Architect should be consulted if there are concerns for the coating building up too thick on the monument.

Sheltercoats should be handled with care as all lime products and not applied in extreme weather conditions, when temperatures could drop under 5^{o}C and there is the risk of frost or in hot/very dry conditions (over 25 ^{o}C) as this would mean quick drying times leading to shrinkage and crazing of the coating. Application should also be avoided when heavy rain is forecast as this would wash away the coating before its curing is achieved. Dampen down sheltercoated areas each day for three days after application and protect the shelter coated surface from exposure to the sun, heat and wind externally by covering with hessian so that the coat dries in a controlled manner. Eventually the result should be uniform in appearance without the detail of the stone carving being obscured and free from obvious defects like runs, sags, wrinkling, bulking or thinning at edges, entrained dust/dirt.

The Contractor shall provide all necessary temporary protection and take precautions against splashing with the lime coat mix any of the below monument areas not scheduled to be coated and must allow for cleaning any spills and splashes caused by lack of protection and care.

A90 GENERAL TECHNICAL REQUIREMENTS

GENERAL

Precedence

General: Where, and to the extent that, documents conflict the following orders of precedence apply:

• Schedules of work override preliminaries, which override contract drawings, which override the Reference specification.

• Work sections of the Reference specification override A90.

Conflict in the documents: Give notice.

Definitions and interpretations - general

Employer's Representative: The person nominated in the Contract as Employer's Representative, Architect, Contract Administrator or Project Manager.

Reference specification: Not all clauses in the Reference specification apply to this project. If in doubt about the applicability of a clause, obtain instructions.

Communication: When required to communicate – including advise, inform, submit, give notice, instruct, agree, confirm, seek or obtain information, consent or instructions, or make arrangements – do so in writing to the Employer's Representative.

Responses from the Employer's Representative: Do not proceed until response has been received.

Definitions and interpretations – products and work

Remove:

• Disconnect, dismantle as necessary and take out the designated products or work and associated accessories, fastenings, supports, linings and bedding materials. Dispose of unwanted materials.

• Excludes taking out and disposing of associated pipework, wiring, ductwork or other services.

Keep for reuse:

• Do not damage designated products or work. Clean off bedding and jointing materials.

Make good:

• Execute local remedial work to designated work. Make secure, sound and neat.

• Excludes redecoration and/ or replacement.

Repair:

• Execute remedial work to designated products. Make secure, sound and neat.

• Excludes redecoration and/ or replacement.

Refix: Fix removed products.

Replace: Supply and fix new products matching those removed. Execute work to match original new state of that removed.

Ease: Adjust moving parts of designated products or work to achieve free movement and good fit in open and closed positions.

Match existing: Provide products and work of the same appearance and features as the original, excluding ageing and weathering. Make joints between existing and new work as inconspicuous as possible.

Documents

Currency: References to published documents are to the editions, including amendments, current on the date of the Invitation to tender.

Services drawings: Diagrammatic, except to the extent that figured dimensions are given or calculable.

Dimensions: Do not rely on scaled dimensions.

COMPLIANCE

Compliance generally

Submittals, samples, inspections and tests: Undertake to suit the Works programme. Do not conceal, or proceed with,
affected work until compliance with requirements is confirmed.
Compliance with proprietary specifications: Retain on site evidence that the proprietary product specified has been
supplied.
Compliance with performance specifications: Submit evidence of compliance, including test reports indicating properties
tested, pass/ fail criteria, test methods and procedures, test results, identity of testing agency, test dates and times,
identities of witnesses, and analysis of results.

Design and production documentation

Design compliance: Submit certification that design complies with documented requirements.
Documentation:
• Draft: Submit complete design and production documentation.
• Final: Submit sufficient copies for distribution to affected parties. Keep at least one copy on site.
Space requirements: Check space requirements of products or work indicated diagrammatically in the contract
documents. Submit a report on consequent variations needed to the design.
Drawings: Include dimensions.

Authorities and statutory undertakers

Approvals: Submit evidence of approvals of relevant authorities and statutory undertakers.

Product samples

Complying samples: Retain in good, clean condition on site.

PRODUCTS AND EXECUTION

General quality

Products generally: New. Proposals for recycled products will be considered.
• Supply of each product: From the same source or manufacturer.
• Whole quantity of each product required to complete the Works: Consistent kind, size, quality and overall appearance.
• Product tolerances: Where critical, measure a sufficient quantity to determine compliance.
Execution generally: Fix, apply, install or lay products securely, accurately, plumb, neatly and in alignment.
• Colour batching: Do not use different colour batches where they can be seen together.
• Dimensions: Check on-site dimensions.
• Finished work: Not defective, e.g. not damaged, disfigured, dirty, faulty, or out of tolerance.

Sizes

General dimensions: Nominal.
Cross section dimensions of timber: Finished dimensions.

Substitution

Products: If an alternative product to that specified is proposed, obtain approval before ordering the product.
Work: If alternative work to that specified is proposed, obtain approval before execution.
Reasons: Submit reasons for the proposed substitution.
Documentation: Submit relevant information, including:
• manufacturer and product reference;
• cost;
• availability;
• relevant standards;
• performance;
• function;
• compatibility of accessories;
• proposed revisions to drawings and specification;
• compatibility with adjacent work;

• appearance; and
• copy of warranty/ guarantee.
Alterations to adjacent work: If needed, advise scope, nature and cost.
Manufacturers' guarantees: If substitution is accepted, submit.

Incomplete documentation

General: Where and to the extent that products or work are not fully documented, they are to be:
• Of a kind and standard appropriate to the nature and character of that part of the Works where they will be used.
• Suitable for the purposes stated or reasonably to be inferred.

Manufacturers' recommendations

General: Comply with manufacturer's current printed recommendations and instructions.
Changes to recommendations or instructions since close of tender: Submit details.
Manufacturers' current recommendations and instructions: Keep copies on site.
Ancillary products and accessories: Use those supplied or recommended by main product manufacturer.
Agrément certified products: Comply with limitations, recommendations and requirements of relevant valid certificates.

Defects in existing work

Reporting undocumented defects: When discovered, immediately give notice. Do not proceed with affected related work
until response has been received.
Documented remedial work: Do not execute work which may:
• hinder access to defective products or work; or
• be rendered abortive by remedial work.

Accuracy, appearance and fit

Tolerances and dimensions: If likely to be critical to execution or difficult to achieve, as early as possible either:
• submit proposals; or
• arrange for inspection of appearance of relevant aspects of partially finished work.

Services runs

General: Provide adequate space and support for services, including unobstructed routes and fixings.
Services inaccessible after installation: Submit proposals for future location and identification of runs and fittings.
Fixing of services: Submit typical details of locations, types and methods of fixing of services to fabric.

Spares

General: Supply designated spares in their original packaging.

D20 EXCAVATING AND FILLING

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Herbicide for treating topsoil before removal

Type: Suitable translocated non-residual herbicide.

Proposed fill materials

Details: Prior to commencing filling, submit full details and test reports of proposed fill materials demonstrating compliance
with specification, including:
• Imported fill: Type and source.
• Material excavated on site: Proposals for processing and reuse.

Hazardous, aggressive or unstable fill materials

General: Do not use fill materials which would, either in themselves or in combination with other materials or ground water,
give rise to a health hazard, damage to building structures or instability in the filling.

Do not use material that is:
• Frozen or containing ice.
• Organic.
• Contaminated or noxious.
• Susceptible to spontaneous combustion.
• Likely to erode or decay and cause voids.
• With excessive moisture content, slurry, mud or from marshes or bogs.
• Clay of liquid limit exceeding 80 and/ or plasticity index exceeding 55.
• Defined in the 'Manual of contract documents for highway works: Volume 1: Specification for highway works', clause
601 as 'Unacceptable materials'.

Frost susceptibility of fill materials
General: Fill must not be frost-susceptible as defined in the 'Manual of contract documents for highway works: Volume 1
Specification for highway works', clause 801.
Test reports: If the following fill materials are proposed, submit a laboratory report confirming they are not frost-susceptible:
• Fine-grained soil with a plasticity index less than 20%.
• Coarse-grained soil or crushed granite with more than 10% retained on a 0.063 mm sieve.
• Crushed chalk.
• Crushed limestone fill with average saturation moisture content in excess of 3%.
• Burnt colliery shale.
Frost-susceptible fill:
• May only be used within the external walls of buildings below spaces that will be heated.
Protect from frost during
construction.
• At suitable depths below the finished ground surface.
• Where frost heave will not affect structural elements.

Compacted fill for landscape areas
Fill: Material capable of compaction by light earthmoving plant.

Type 3 unbound mixture
Fill: To 'Manual of contract documents for highway works: Volume 1 Specification for highway works', clause 805:
• Crushed rock (other than argillaceous rock).
• Recycled concrete aggregates.
• Crushed blast furnace slag.

Sand blinding
Sand for blinding: To BS EN 12620, grade 0/4 or 0/2 (MP).
Alternative fine materials: Submit proposals.

EXECUTION
Site clearance
Timing: Before removal of topsoil, if any.
General: Clear site of rubbish, debris and vegetation. Do not compact topsoil.
Removing small trees, shrubs, hedges and roots
Safety: Comply with recommendations in BS 3998, and in accordance with Forestry Industry Safety Accord (FISA) Safety
Guides.
Removing topsoil
General: Before commencing general excavation or filling, remove topsoil from areas where there will be regrading,
buildings, pavings, roads and other areas shown on drawings.
Depth of topsoil difficult to determine: Give notice.
Around trees: Do not remove topsoil from below the spread of trees to be retained.
Handling topsoil
Aggressive weeds:
• Give notice and obtain instructions before moving topsoil containing aggressive weeds included in the Weeds Act,

section 2 or the Wildlife and Countryside Act, Schedule 9, part II.
• Minimize disturbance, trafficking and compaction.
Contamination: Do not mix topsoil with the following:
• Subsoil, stone, hardcore, rubbish or material from demolition work.
• Other soil or material containing aggressive weeds, sharps, plastics and non-soil-forming materials, and notifiable
animal or plant diseases.
• Oil, fuel, cement or other substances harmful to plant growth.
• Other grades of topsoil.
Multiple handling: Keep to a minimum. Use topsoil immediately after removal.
Wet conditions: Handle topsoil in the driest condition possible. Do not handle during or after heavy rainfall or when the
moisture content of the topsoil is greater than the plastic limit as defined by BS 3882.

Adjacent excavations

Proximity: Where an excavation encroaches below a line drawn at an angle from the nearest formation level of another
higher excavation, the lower excavation, all work within it and backfilling thereto must be completed before the higher
excavation is made.
• Angle of line from horizontal: 45° for stable soils, 30° for wet clays.

Permissible deviations from formation levels

Beneath mass concrete foundations: ±25 mm.
Beneath ground bearing slabs: +0 mm to -25 mm.
Beneath reinforced concrete foundations: ±15 mm.
Embankments and cuttings: ±50 mm.
Ground abutting external walls: ±50 mm, but finished level must be at least 150 mm below dpc.

Inspecting formations

Give notice: Make advance arrangements for inspection of formations.
Preparation: Just before inspection remove the last 150 mm of excavation. Trim to required profiles and levels, and
remove loose material.
Formations: Seal with concrete within 4 hours of inspection.

Foundations

Give notice if:
• A natural bearing formation of undisturbed subsoil is not obtained at the depth shown on the drawings; or
• The formation contains soft or hard spots or highly variable material.

Unstable ground

Generally: Keep excavation stable at all times.
Give notice: Without delay, if newly excavated faces are too unstable to allow earthwork support to be inserted.
If instability is likely to affect adjacent structures or roadways: Take appropriate emergency action.

Recorded features

Recorded foundations, beds, drains, manholes, etc.: Break out and seal drain ends.
Contaminated earth: Remove and disinfect as required by local authority.

Unrecorded features

Give notice: If unrecorded foundations, beds, voids, basements, filling, tanks, pipes, cables, drains, manholes,
watercourses, ditches, etc. are encountered.

Existing watercourses

Diverted watercourses which are to be filled: Before filling, remove vegetable growths and soft deposits.

Topsoil & subsoil

Retained excavated material:
• Stockpile in separate temporary storage heaps. Store subsoil to be reused for landscaping in accordance with BS 8601,
clause 6.2.
• Spread and level surplus subsoil on site. Spread subsoil and topsoil to be used for landscaping in accordance with BS

8601, clause 6.3.
• Protected areas: Do not raise soil level within root spread of trees that are to be retained.
• Prepare receiving areas for spreading of subsoil to be used for landscaping in accordance with BS 8601, clause 6.4.
Remaining material: Remove from site.

Water

Generally: Keep excavations free from water until:
• Formations are covered;
• Below-ground constructions are completed; and
• Basement structures and retaining walls are able to resist leakage, water pressure and flotation.
Drainage: Form surfaces of excavations and fill to provide adequate falls.
Removal of water: Provide temporary drains, sumps and pumping as necessary. Do not pollute watercourses. Discharge
water in accordance with local authority agreements, public body agreements and other statutory agreements where applicable.

Ground water level/ Running water

Give notice:
• If excavations are below water table.
• If springs or running water are encountered.

Pumping

General: Do not disturb excavated faces or stability of adjacent ground or structures.
Pumped water: Discharge without flooding the site or adjoining property.
Sumps: Construct clear of excavations. Fill on completion.

Placing fill

Excavations and areas to be filled: Free from loose soil, rubbish, topsoil, organic material and standing water.
Freezing conditions: Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not
damaged after thawing.
Adjacent structures, membranes and buried services:
• Do not overload, destabilize or damage.
• Submit proposals for temporary support necessary to ensure stability during filling.
• Allow 14 days (minimum) before backfilling against in situ concrete structures.
Layers: Place so that only one type of material occurs in each layer.
Earthmoving equipment: Vary route to avoid rutting.

Compaction

General: Compact fill as soon as possible after placing.
After compaction: Surface of each layer must be well closed, showing no movement under compaction plant, and without
cracks, holes, ridges, loose material and the like.
Defective areas: Remove and recompact to full thickness of layer using new material.

Geotextile sheeting

Preparation: Before laying, remove humps and sharp projections. Fill hollows.
Protect from:
• Exposure to light, during laying.
• Contaminants.
• Materials listed as potentially deleterious by geotextile manufacturer.
• Damage until fully covered by fill.
• Wind uplift.

Compacted filling for landscape areas

Laying: Lightly compact each layer to produce a stable soil structure in accordance with BS 8601.

Unbound mixtures

Filling: To 'Manual of contract documents for highway works: Volume 1 Specification for highway works', clauses 801–804.

Compacted general filling

Excavated material: Select suitable material and keep separate.
Filling: Spread and level material in layers. As soon as possible thoroughly compact each layer.
Proposals: Well in advance of starting work submit details of proposed:

• Materials to be used, including quantities of each type.
• Type of plant.
• Maximum depth of each compacted layer.
• Minimum number of passes per layer.

Backfilling around foundations

Under oversite pavings: Lay and compact hardcore. Thoroughly compact each layer.
Under grassed or soil areas: Lay and compact in 300 mm (maximum) layers. Lightly compact each layer to produce a
stable soil structure.

Hardcore filling

Filling: Spread and level in 150 mm (maximum) layers. Compact each layer thoroughly.

Venting hardcore layer

Filling: Spread and level in 150 mm (maximum) layers. Thoroughly compact each layer whilst maintaining enough voids to
allow efficient venting. Do not over-compact.

Blinding

Surfaces (other than venting hardcore layer) to receive sheet overlays or concrete, blind with:
• Concrete where shown on drawings.
• Sand or fine gravel applied to fill interstices. Moisten as necessary before final rolling to provide a flat, closed, smooth
surface.
• Permissible deviations on surface level: +0 and -25 mm.

Q10 KERBS, EDGINGS, CHANNELS AND PAVING ACCESSORIES

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Precast concrete kerbs, edgings and channels

Standard: To BS EN 1340.

Drainage channel systems with gratings

Loading grade standard: To BS EN 124-1.

Concrete for foundations and haunching

Standard: To BS 8500-2.

Steel bar dowels for haunching

Standard: To BS 4482.

Mortar for bedding and jointing

Portland cement: To harmonized standard BS EN 197-1, CEM I 42.5 N.
Aggregate/ sand: To harmonized standard BS EN 12620, Grade 0/4 or 0/2 (MP).

EXECUTION

Laying kerbs, edgings and channels

Cutting: Neat, accurate and without spalling. Form neat junctions.
• Long units (450 mm and over) minimum length after cutting: 300 mm.
• Short units minimum length after cutting: The lower of one third of their original length or 50 mm.
Bedding: Position true to line and level along top and front faces, in a mortar bed on accurately cast foundations.
Securing: After bedding has set, secure with a continuous haunching of concrete.

Haunching dowels

Size: 12 mm diameter, 150 mm long.
Installation: While concrete is plastic, insert dowels vertically into foundation.
• Centres: 450 mm.
• Distance from back face of kerb: 50 mm.
• Projection: 75 mm.
Haunching: Rectangular cross section, cast against formwork, fully enclosing and protecting dowels.

Channels
Installation: Lay to an even gradient. Avoid ponding and backfall.
Lowest points of channels: 6 mm above drainage outlets.
Drainage channel systems
Installation:
• Constant depth channels: Lay to an even gradient. Avoid ponding and backfall. Commence laying from outlets.
• Channel systems with a built in fall: Lay with top of channels level, installed in correct sequence to form an even
gradient without ponding or backfall. Commence laying from outlets.
Silt and debris: Immediately before handover, remove from entire system.
Washing and detritus: Safely dispose without discharging into sewers or watercourses.
Accuracy
Deviations (maximum):
• Level: ± 6 mm.
• Horizontal and vertical alignment: 3 mm in 3 m.
Mortar joints
Jointing: As laying proceeds, butter ends of units with bedding mortar. Completely fill joints.
• Narrow mortar joints: Tightly butt. Clean off surplus mortar immediately.
• Tooled mortar joints: Tool to a neat flush profile.

Q20 GRANULAR SUB-BASES TO PAVINGS

GENERAL
Cross-reference
General: Read with A90 General Technical requirements.

PRODUCTS
Granular material
Quality: Free from excessive dust, well graded, all pieces less than 75 mm in any direction, minimum 10% fines value of
50 kN when tested in a soaked condition to BS 812-111 or a resistance to fragmentation of LA50 for the Los Angeles test
to BS EN 1097-2.
In any one layer only one of the following groups:
• Crushed rock (other than argillaceous rock) or quarry waste with not more binding material than is required to help hold
the stone together.
• Crushed concrete, crushed brick or tile, free from plaster, timber and metal.
• Crushed non-expansive slag.
• Gravel or hoggin with not more clay content than is required to bind the material together, and with no large lumps of
clay.
• Well-burned non-plastic colliery shale.
• Natural gravel.
• Natural sand.
Type 3 unbound mixture
Standard: Manual of contract documents for highway works (MCHW) 'Specification for highway works'.
• Type 3 unbound mixture: To MCHW Volume 1: Specification for highway works (SHW), clauses 801 and 805.
Non frost susceptible material
Definition (non frost susceptible material): To MCHW Volume 1: Specification for highway works (SHW), clause 801.

EXECUTION
Excavation of subgrades
Final excavation to formation/ sub-formation level: Carry out immediately before compaction of subgrade.

Soft spots and voids: Give notice.
Wet conditions: Do not excavate or compact when the subgrade may be damaged or destabilised.

Installation of geotextile filter/ separator membrane

Protect from:
• Exposure to light, except during laying (maximum five hours).
• Contaminants.
• Materials listed as potentially deleterious by geotextile manufacturer.
• Damage, until fully covered by fill.
• Wind uplift, by laying not more than 15 m before covering with fill.

Preparation: Remove humps and sharp projections and fill hollows before laying.Preparation/

compaction of subgrades

Timing: Immediately before placing sub-base.
Soft or damaged areas: Excavate and replace with sub-base material, compacted in layers 300 mm (maximum) thick.
Compaction: Thoroughly, by roller or other suitable means, adequate to resist subsidence or deformation of the subgrade
during construction and of the completed pavings when in use. Take particular care to compact fully at intrusions,
perimeters and where local excavation and backfilling has taken place.

Compaction of sub-base

Laying for vehicular areas: To MCHW Volume 1: Specification for highway works (SHW), clause 802.
Proposals: Well in advance of starting work submit details of:
• Maximum depth of each compacted layer.
• Type of plant.
• Minimum number of passes per layer.
Preparation: Remove loose soil, rubbish and standing water.
Structures, membranes and buried services: Ensure stability and avoid damage.
Laying: Spread and level in layers. As soon as possible thereafter thoroughly compact each layer.
At drainage fittings, inspection cover bases and at perimeters: Take particular care to compact fully.
After compaction and immediately before overlaying: The sub-base surface must be uniformly well closed and free from
loose material, cracks, ruts or hollows.

Blinding

Finish: Vibrate to provide a flat, closed, smooth surface.

Cold weather working

Frozen materials: Do not use.
Freezing conditions: Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not
damaged after thawing.

Protection

Sub-bases: As soon as practicable, cover with subsequent layers, specified elsewhere.
Subgrades and sub-bases: Prevent degradation by construction traffic, construction operations and inclement weather.

Q23 GRAVEL, HOGGIN AND WOODCHIP DRIVES AND PAVINGS

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Bonded Chippings

Standard: To BS EN 13043.
Compatibility: Chippings suitable for use with respective binders/ emulsions.

Hoggin
Material: Naturally occurring material consisting of sand and gravel, with minimum clay content required to bind the
material together, with no large lumps of clay.
Grading for use in surface course: 85% (minimum) by weight passing a 10 mm BS sieve.
Woodchips
Quality: Free from pests, disease, weeds and any additives.
Bitumen emulsions for bonded chippings
Standard: To BS 434-1, class A1 60.

EXECUTION
Blinding to sub-bases
Laying: Compact. Seal interstices. Provide free drainage.
Herbicide to paving
Type: Suitable for the application, location and conditions of use.
Weeds and moss: Grub up.
Laying generally
Channels, gullies, etc: Keep clear.
Completion: Compact to produce a firm, regular surface, stable in use.
Finished surfaces:
• Lines and levels: To prevent ponding.
• Overall texture: Even.
• State at completion: Clean.
Cold weather working
Frozen materials: Do not use.
Freezing conditions: Do not lay pavings.
Cold bituminous surface dressings: Do not apply when ambient temperature is below 10°C.
Drainage falls
Sealed surfaces.
• Falls and cross falls: 1:40 (minimum).
• Camber: 1:50 (minimum).
Unsealed surfaces: 1:30 (minimum).
Granular surfaces in vehicular areas
Permissible deviation from required levels, falls and cambers: ±20mm (maximum).
General: Spread and level in 150 mm (maximum) layers. As soon as possible compact each layer.
Dry weather: Lightly water layers during compaction.
Granular surfaces in pedestrian areas and cycle tracks
Permissible deviation from required levels, falls and cambers: ±12 mm (maximum).
General: Spread and level in 100 mm (maximum) layers. As soon as possible compact each layer.
Dry weather: Lightly water layers during compaction.
Gravel
General: Loose laid and raked to uniform thickness.
Laying bonded chippings
Base course:
• Vehicular use: Cover with clean chippings at specified rate and compact.
• Pedestrian and cycle use: Cover with stone dust or sand. Brush into interstices.
Consolidation: Before application of surface course, allow surface to dry and consolidate.
Surface course: Uniformly spray binder at specified rate. Cover with clean chippings. Provide 100–105% shoulder to
shoulder coverage to BS 598-1 and compact.
Compaction to all layers: By heavy roller or other appropriate means, adequate to resist subsidence or deformation of the
completed roads/ pavings when in use. Do not crush chippings.
Completion: Before trafficking, remove excess chippings.
Protection from traffic and plant
Paved areas: Restrict access to prevent damage.

Q25 SLAB, BRICK, SETT, OR COBBLE PAVINGS

GENERAL
Cross-reference
General: Read with A90 General technical requirements.
Completion of design by contractor
Natural stone slab paving system: In accordance with BS 7533-4.
Design proposals
Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

PRODUCTS
Standards:
Natural stone slabs: To BS EN 1341.
Natural stone setts: To BS EN 1342.
• Freeze/ thaw resistance: Class 1 (F1).
Laying course sand for sand bedded flags: To BS 7533-4, maintained at even moisture content that will give maximum compaction.
Sand for mortar to fully bedded slab/ flag paving: To BS EN 12620, grading 0/4 or 0/2 (MP) or 0/2 or 0/1 (FP).
Nonhydraulic lime for mortar bedding and pointing: To BS EN 459-1, -2 and -3.
Ready-mixed lime:sand for mortar bedding and pointing: To BS EN 998-2.

EXECUTION
Adverse weather
General:
• Temperature: Do not lay or joint paving if the temperature is below 3°C on a falling thermometer or below 1°C on a
rising thermometer.
• Frozen materials: Do not use. Do not lay bedding on frozen or frost covered bases.
Paving with mortar joints and/ or bedding: Protect from frost damage, rapid drying out and saturation until mortar has
hardened.
Paving laid and jointed in sand:
• Stockpiled bedding sand: Protect from saturation.
• Exposed areas of sand bedding and uncompacted areas of sand bedded paving: Protect from heavy rainfall.
• Saturated sand bedding: Remove and replace, or allow to dry before proceeding.
• Laying dry-sand jointed paving in damp conditions: Brush in as much jointing sand as possible. Minimize site traffic over paving. As soon as paving is dry, top up joints and complete compaction.
Laying pavings – general
Appearance: Smooth and even with regular joints and accurate to line, level and profile.
Falls: To prevent ponding.
Bedding of paving units: Firm so that rocking or subsidence does not occur or develop.
• Bedding/ Laying course: Consistently and accurately graded, spread and compacted to produce uniform thickness and support for paving units.
Slopes: Lay paving units upwards from the bottom of slopes.
Paving units: Free of mortar and sand stains.
Cutting: Cut units cleanly and accurately, without spalling, to give neat junctions with edgings and adjoining finishes.
Levels of paving
Permissible deviation from specified levels (generally): ± 6 mm.
Regularity
Maximum variation in gap under a 3 m straight edge placed anywhere on the surface (where appropriate in relation to the
geometry of the surface): 10 mm.
Sudden irregularities: Not permitted.
Difference in level between adjacent blocks/ pavers/ setts (maximum): 2 mm.

Colour banding
General: Unless premixed by manufacturer, select from at least 3 separate packs in rotation to avoid colour banding.
Protection
Cleanliness: Keep paving clean and free from mortar droppings, oil and other materials likely to cause staining.
Materials storage: Do not overload pavings with stacks of materials.
Handling: Do not damage paving unit corners, arrises, or previously laid paving.
Mortar bedded pavings (ordinary site mixed mortar without additives): Keep free from traffic after laying:
• Pedestrian traffic (minimum): 4 days.
• Vehicular traffic (minimum): 10 days.
Access: Restrict access to paved areas to prevent damage from site traffic and plant.
Condition of sub-bases/ bases before spreading bedding (laying course)
Trenches and excavation of soft or loose spots in subgrade: Fill and thoroughly compact.
Granular surfaces: Lay and compact so as to be sound, clean, smooth and close-textured enough to prevent migration of
bedding/ laying course materials into the sub-base during compaction and use, free from movement under compaction
plant and free from compaction ridges, cracks and loose material.
Prepared existing and new bound bases (roadbases): Sound, clean, free from rutting or major cracking. Remove sharp stones, projections and debris.
Sub-base/ Roadbase level tolerances: To BS 7533-7, Annex A.
Levels and falls: Accurate and within the specified tolerances.
Drainage outlets: Within +0–10 mm of the required finished level.
Features in sand bedded paving (including mortar bedded restraints and drainage ironwork): Complete to required levels; adequately bed and haunch in mortar.
Sub-bases containing cement/ hydraulic binder: Cure for minimum times specified in BS 7533-4.
Drainage holes in existing bases
Location: Impervious layers of existing road/ paving where new paving is to be overlayed on sand laying course.
Drainage: Form regular grid of holes, through base and any additional build up, down to sub-base:
• Spacing in both directions: 1000 mm.
• Clear opening (minimum): 30 mm. Do not weaken or excessively disturb road/ paving.
Completion: Remove jagged or protruding edges. Fill voids with pea gravel. Ram down to form flush smooth surface.
Laying geotextile sheet patches over drainage holes: Lay geotextile patches on the base, centred over each hole.
Planing and repairs to existing bases
Existing macadam/ asphalt surfaces: Plane to required levels.
Repairs: Cut out depressions. Cut out cracks over 25 mm wide. Fill to match existing surface and compact.
Building up existing surfaces to required levels: Regulate using coated macadam to BS EN 13108-1 or rolled asphalt to
BS EN 13108-4.
Laying geotextile sheet edging strips
Location: Immediately below sand laying course, abutting features which interrupt the laying course, including:
• Perimeters/ Edge restraints/ Kerbs.
• Other types of paving.
• Drainage fittings, e.g. channels and manholes.
Edge detail: Turn sheet up to a height not less than thickness of sand bedding to form an upstand fitted neatly against features.
• Width (minimum): 1000 mm.
Laying geotextile sheet overlays
Location: Immediately below sand laying course.
Laying: Fit neatly at edge restraints and other features that interrupt sand laying course, e.g. drainage fittings, channels,
manholes and kerbs.

Edge detail: Turn sheet up to form an upstand against features, height not less than thickness of sand bedding.
• Width (minimum): 1000 mm.

Laying flag and slab paving – sand laying course and jointing

Standard: In accordance with BS 7533-4.
Flag installation and cutting: To Interpave 'Concrete flag paving'.

Completion of paving with dry sand or fine aggregate filled joints

Sand dressing: Leave a thin layer of dry jointing sand over the paving, sweep clean before practical completion.
Final compaction of the surface course: In accordance with BS 7533-3.
Vacuum cleaning machines: Not allowed.

PART 3 SCHEDULE OF WORKS

£

1.0 Preparatory Works

1.1 Before any works commence, take a photographic record of all areas of the works. **Make a photographic record of all significant stages in the undertaking of all repair works on site.**
Submit a copy of the images in JPEG format digitally to the architect periodically (once per 2 weeks).

1.2 Provide and erect all necessary scaffolding, access equipment and temporary works to facilitate the works specified hereinafter. All permanent scaffolding is to be designed and installed by a competent firm and is to provide safe access for the higher level works. All scaffolding, hoists, safety rails, platforms etc. must comply with HSE guidelines. Scaffolding should be galvanised and free from rust. **Scaffold ends adjacent to the monument are to be protected with plastic caps**. All scaffolding should be free standing- no fixings into the monument's masonry will be allowed. The lower part of scaffolding should be protected against unauthorised access as described below and all ladders removed when the site is not attended. Temporary scaffolding is to be dropped each day and safely stored.

1.3 To any scaffolding accessible from ground level, provide and fix sheet metal hoardings around the base of the external scaffolding 2.5m in height minimum, and install debris netting above. Provide and lay light weight plastic sheeting to protect the lower levels of the monument from falling dust and debris as necessary.
To the fixed scaffolding, allow for providing and installing an intruder alarm system at the top of the hoarding level, with 2No dummy CCTV cameras and security lighting above at high level.

1.4 Provide and install all necessary temporary protection to the monument. Every effort must be taken to protect the fabric of the memorial and all persons working on the project are to be made aware of this by the provision of information at site induction training. If any damage occurs to the monument this is a serious matter and must be reported immediately to the Architect or Surveyor.

1.5 Allow for all necessary inspections of the fabric from the scaffold by the architect.

1.6 At the end of the works, take down the scaffolding and temporary works and safely remove from site. Ensure all debris is removed from site and re-seed any areas of damaged grass.

TOTAL FOR SECTION 1
To be carried forward to Tender Summary (page 34)

2.0 Stone Plinth Repairs- Step 1

£

Refer to Drawing 3501/101A & 104

2.1 All works to take place in sections only to one side of the base plinth each time and be completed fully before progressing to the next side. Before works to each side, a good record of all the stones that will be temporarily removed needs to be made so that these are reinstated back in the correct order and position.

Following the suggested sequence of works (Side A> Side D> Side F> Side H> Side B> Side E> Side G> Side C), to each side at a time carefully cut out and lift all coping stones from the base of the plinth. Sort out the defective ones (do not cart away without the expressed approval of the Architect and/ or Employer) and store all sound stone safely for re-instatement. Remove the damp proof course and all the concrete mortar bedding under the coping stone course. Clean carefully with a soft brush all loose material. Carefully remove all defective stones each side as shown on the drawing and proceed with the stone repairs according to the schedule and specification provided. All new stonework is to be tooled to match the original. Allow for full disassembly of the stonework if this is found to be universally bedded in hard cementitious mortar. Reinstate all sound stonework disassembled along with any replacement stone onto a lime mortar bed according to the specification provided.
If no full disassembly takes place, allow for raking out all stone joints to minimum 40mm depth.
Repoint all joints with the specified mortar to all sides.

2.2 Side A:

- Undertake 2No stone tile repairs (A2 & A3) as identified in the stone schedule attached and according to provided specification.

- Undertake 1No plastic repair (A1) as identified in the stone schedule attached and according to provided specification.

Where making plastic repairs, dress off loose and friable stonework and make plastic repairs to match the original, all as described in Part 2 of this document.

- Undertake 100% repointing to the full side. Rake out to min. 40mm depth and repoint in 1: 2.25: 0.25 NHL 3.5: well graded sand: graded crushed stone mortar to the coping stones and 1:2.25: 0.5 Lime putty: well graded-sand: graded crushed stone mortar with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 5% by volume of coarse stuff to rest of elevation as identified in drawing 3501/104. All joints to be finished flush with the stone.

- Provisionally allow for full disassembly of the stonework to the side after careful recording- store sound stones for re-instatement.

TOTAL FOR PAGE £
To be carried forward to Section 2 Collection (page 30)

£

- Provisionally allow for 20% of the entire stone surface for additional full stone replacement, the extent and locations of repairs are to be agreed with the architect on site.

2.3 Side B:

- Undertake 2No full stone replacements (B2 & B3) as identified in the stone schedule attached and according to provided specification.

- Undertake 2No plastic repairs (B1, B4) as identified in the stone schedule attached and according to provided specification.

Where making plastic repairs, dress off loose and friable stonework and make plastic repairs to match the original, all as described in Part 2 of this document.

- Undertake 1No fracture repair BC-1 as identified in the stone schedule attached and according to provided specification.

- Undertake 100% repointing to the full side. Rake out to min. 40mm depth and repoint in 1: 2.25: 0.25 NHL 3.5: well graded sand: graded crushed stone mortar to the coping stones and 1:2.25: 0.5 Lime putty: well graded-sand: graded crushed stone mortar with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 5% by volume of coarse stuff to rest of elevation as identified in drawing 3501/104. All joints to be finished flush with the stone.

- Provisionally allow for full disassembly of the stonework to the side after careful recording- store sound stones for re-instatement.

- Provisionally allow for 20% of the entire stone surface for additional full stone replacement, the extent and locations of repairs are to be agreed with the architect on site.

2.4 Side C:

- Undertake 2No full stone replacements (C3 & C4) and 3No full coping stone (C1, C2, DC-1) replacements as identified in the stone schedule attached and according to provided specification.

- Undertake 2No fracture repairs (BC-1 and BC-2) as identified in the stone schedule attached and according to provided specification.

- Undertake 100% repointing to the full side. Rake out to min. 40mm depth and repoint in 1: 2.25: 0.25 NHL 3.5: well graded sand: graded crushed stone mortar to the coping stones and 1:2.25: 0.5 Lime putty: well graded-sand: graded crushed stone mortar with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 5% by volume of coarse stuff to rest of elevation as identified in drawing 3501/104. All joints to be finished flush with the stone.

- Provisionally allow for full disassembly of the stonework to the side after careful recording- store sound stones for re-instatement.

TOTAL FOR PAGE £

To be carried forward to Section 2 Collection (page 30)

- Provisionally allow for 20% of the entire stone surface for additional full stone replacement, the extent and locations of repairs are to be agreed with the architect on site.

£

2.5 Side D:

- Undertake 2No full stone (De & D4) replacements as identified in the stone schedule attached and according to provided specification.

- Undertake 1No indent stone repair (D1) as identified in the stone schedule attached and according to provided specification.

- Undertake 1No plastic repair (D2) as identified in the stone schedule attached and according to provided specification.

Where making plastic repairs, dress off loose and friable stonework and make plastic repairs to match the original, all as described in Part 2 of this document.

- Undertake 100% repointing to the full side. Rake out to min. 40mm depth and repoint in 1: 2.25: 0.25 NHL 3.5: well graded sand: graded crushed stone mortar to the coping stones and 1:2.25: 0.5 Lime putty: well graded-sand: graded crushed stone mortar with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 5% by volume of coarse stuff to rest of elevation as identified in drawing 3501/104. All joints to be finished flush with the stone.

- Provisionally allow for full disassembly of the stonework to the side after careful recording- store sound stones for re-instatement.

- Provisionally allow for 20% of the entire stone surface for additional full stone replacement, the extent and locations of repairs are to be agreed with the architect on site.

2.6 Side E:

- Undertake 3No full stone (E2, E3, E4) and 1No full coping stone (FE-1) replacements as identified in the stone schedule attached and according to provided specification.

- Undertake 1No indent stone repair (E1) as identified in the stone schedule attached and according to provided specification.

- Undertake 3No plastic repairs (E5, E6, E7) as identified in the stone schedule attached and according to provided specification.

Where making plastic repairs, dress off loose and friable stonework and make plastic repairs to match the original, all as described in Part 2 of this document.

- Undertake 100% repointing to the full side. Rake out to min. 40mm depth and repoint in 1: 2.25: 0.25 NHL 3.5: well graded sand: graded crushed stone mortar to the coping stones and 1:2.25: 0.5 Lime putty: well graded-sand: graded crushed stone mortar with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 5% by volume of coarse stuff to rest of

TOTAL FOR PAGE £

To be carried forward to Section 2 Collection (page 30)

elevation as identified in drawing 3501/104. All joints to be finished flush with the stone.

£

- Provisionally allow for full disassembly of the stonework to the side after careful recording- store sound stones for re-instatement.

- Provisionally allow for 20% of the entire stone surface for additional full stone replacement, the extent and locations of repairs are to be agreed with the architect on site.

2.7 Side F:

- Undertake 3No full stone (F1, F2, F3) replacements as identified in the stone schedule attached and according to provided specification.

- Undertake 1No indent stone repair (F4) as identified in the stone schedule attached and according to provided specification.

- Undertake 1No plastic repair to the coping stone FG-1 as identified in the stone schedule attached and according to provided specification.

Where making plastic repairs, dress off loose and friable stonework and make plastic repairs to match the original, all as described in Part 2 of this document.

- Undertake 100% repointing to the full side. Rake out to min. 40mm depth and repoint in 1: 2.25: 0.25 NHL 3.5: well graded sand: graded crushed stone mortar to the coping stones and 1:2.25: 0.5 Lime putty: well graded-sand: graded crushed stone mortar with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 5% by volume of coarse stuff to rest of elevation as identified in drawing 3501/104. All joints to be finished flush with the stone.

- Provisionally allow for full disassembly of the stonework to the side after careful recording- store sound stones for re-instatement.

- Provisionally allow for 20% of the entire stone surface for additional full stone replacement, the extent and locations of repairs are to be agreed with the architect on site.

2.8 Side G:

- Undertake 3No full stone (G2, G3, G4) replacements as identified in the stone schedule attached and according to provided specification.

- Undertake 1No indent stone repair (G1) as identified in the stone schedule attached and according to provided specification.

- Undertake 100% repointing to the full side. Rake out to min. 40mm depth and repoint in 1: 2.25: 0.25 NHL 3.5: well graded sand: graded crushed stone mortar to the coping stones and 1:2.25: 0.5 Lime putty: well graded-sand: graded crushed stone mortar with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 5% by volume of coarse stuff to rest of

TOTAL FOR PAGE £

To be carried forward to Section 2 Collection (page 30)

elevation as identified in drawing 3501/104. All joints to be finished flush with the stone.

- Provisionally allow for full disassembly of the stonework to the side after careful recording- store sound stones for re-instatement.

- Provisionally allow for 20% of the entire stone surface for additional full stone replacement, the extent and locations of repairs are to be agreed with the architect on site.

2.9 Side H:

- Undertake 1No full coping stone (H1) replacement as identified in the stone schedule attached and according to provided specification.

- Undertake 1No indent stone repair (H2) as identified in the stone schedule attached and according to provided specification.

- Undertake 100% repointing to the full side. Rake out to min. 40mm depth and repoint in 1: 2.25: 0.25 NHL 3.5: well graded sand: graded crushed stone mortar to the coping stones and 1:2.25: 0.5 Lime putty: well graded-sand: graded crushed stone mortar with an added pozzolan of Ground Granulated Blast-Furnace Slag (GGBS) at a ratio of 5% by volume of coarse stuff to rest of elevation as identified in drawing 3501/104. All joints to be finished flush with the stone.

- Provisionally allow for full disassembly of the stonework to the side after careful recording- store sound stones for re-instatement.

- Provisionally allow for 20% of the entire stone surface for additional full stone replacement, the extent and locations of repairs are to be agreed with the architect on site.

TOTAL FOR SECTION 2
To be carried forward to Tender Summary (page 34)

3.0 Stone Plinth Repairs- Step 2

Refer to Drawing 3501/104

3.1 When works to step 1 are complete to all sides, make a small section (area TBA with the Architect in advance) to Step 2 to ascertain if there is any damp proof course and cementitious bedding under the stones.

3.2 Allow a provisional sum for their removal and stone reinstatement in sections, according to the methodology and sequencing suggested for Step 1.

3.3 Undertake 1No indent repair to the stone step corner AH-2 as identified in the stone schedule attached and according to the provided specification.

TOTAL FOR SECTION 3
To be carried forward to Tender Summary (page 34)

4.0 Stone Plinth Repairs- Step 3

£

Refer to Drawing 3501/104

4.1 Make a small section (area TBA with the Architect in advance) to Step 3 to ascertain if there is any damp proof course and cementitious bedding under the stones.

4.2 Allow a provisional sum for their removal and stone reinstatement in sections, according to the methodology and sequencing suggested for Step 1.

4.3 Undertake 1No full step stone (BC-3) replacement as identified in the stone schedule attached and according to the provided specification.

4.4 Undertake 1No plastic repair to the step stone AH-3 as identified in the stone schedule attached and according to the provided specification.

Where making plastic repairs, dress off loose and friable stonework and make plastic repairs to match the original, all as described in Part 2 of this document.

TOTAL FOR SECTION 4
To be carried forward to Tender Summary (page 34)

5.0 Top Cross repairs/ protection works

5.1 Prepare the Top Cross surface by gently removing any loose material, cleaning the surface carefully and making any mortar repairs as required after agreement with the Architect on site.

5.2 Apply a lime putty mortar mix as sheltercoat to the prepared surface in several coats according to the specification provided.

TOTAL FOR SECTION 5
To be carried forward to Tender Summary (page 34)

6.0 Paving

Refer to Drawing 3501/102A
Location: Full existing paving extent

To the entire paved area surrounding the memorial, allow for the following works in the suggested sequence (working from North lower ground level to South higher ground level):

6.1 Before taking up the flags, carefully record the pattern and layout of the existing paving by numbering each flag in preparation for re-instating the paving.

6.2 Carefully take up the existing flags, clean off any bedding material and set aside for re-instatement. The stone edgings are to be retained undisturbed in situ unless their current foundation is deemed insufficient.

6.3 Excavate the freed area to a sufficient depth to provide a subbase according to drawing details. Excavation depth not to exceed the monument's foundation level- if this is too shallow seek the Architect's advice.

6.4 Lay the sub-base made of DTp Type 3 aggregate to a minimum depth of 100mm on geotextile membrane.

		£
6.5	Re-bed the existing stone flags previously set aside onto a sand bedding min 30mm (depending on the thickess of the slab). The inner course slabs will have to be cut off by 100mm to their inner side to create a 100mm edge border around the memorial (retain the cut offs and crush to form part of the gravel mixture). Take care to reinstate the existing slabs to the existing pattern as recorded (see above).	
6.6	Point the flags with 1: 2.25: 0.25 NHL 3.5: well graded sand: graded crushed stone with a flush joint - joint widths are to match the existing.	
6.7	Infill the created edge border with limestone gravel graded 6-10mm to match the colour of the paving, mixed with the crushed cut offs from the paving flags, in slight recess (up to 10mm) from the paving level.	

TOTAL FOR SECTION 6
To be carried forward to Tender Summary (page 34)

• **Lift existing stone paving (Q25)**
Preparation: Survey and record the stone paving for re-instatement after completion of the ground works.
Description: Lift all stone flags in stages working from lower to higher ground level (North to South) according to the sequence shown on the drawing. Store aside safely for reinstatement.
• **Existing Stone Edgings (Q10)**
Condition: Retain in situ unless current foundation not deemed sufficient.
• **Excavation (D20)**
Ground Conditions: To be confirmed on site by contractor.
Extent: Not to extend beyond the monument's foundations- depth TBA on site.
• **Granular Sub Base (Q20)**
Material: Type 3 unbound aggregate mixture.
Minimum Thickness: 100 mm.
Accuracy Of Sub Base: ±12 mm from required falls and cambers.
• **Herbicide For Subgrade: Only if deemed necessary (Q20)**
Manufacturer: Contractor's choice.
Product Reference: Submit proposals.
Type: Contractor's choice.
Preparation: Grub-up vegetation.
• **Blinding To Sub Base For Sand Bedded Paving (Q20)**
Location: All sand bedded pavings.
Material: Sand.
Minimum Thickness: 30 mm.
Finish: Close, smooth, compacted surface.
• **Geotextile Sheet (Q25)**
Manufacturer: Terram
Product Reference: T1000
Type: Geotextile filter sheet.
Location: As drawing.
• **Sand Bedding For Flag Paving (Q25)**
Type: Graded natural sharp sand.
Nominal Thickness After Final Compaction: 30 mm with a tolerance of -10 to +5 mm.
• **Stone Flag Paving (Q25)**
Size: Outer course as existing, inner course to be cut off by 100mm to accommodate gravel boundary.
Layout: As existing.
Jointing: As existing
• **Loose Laid Gravel to inner edge (Q23)**
Source: Contractor's choice.
Product Reference: Limestone chippings
Size: Graded 6-10 mm.

Colour: Natural to match the flagstones.
Thickness: estimated to75 mm- as shown on drawing.

7.0 Contingency Sum

7.1 Include a 15% of the overall cost for contingencies. This sum will only be expended upon the formal instruction of the Architect.

To be carried forward to Tender Summary (page 34)

SCHEDULE OF RATES

8.0 MEASURED WORKS

8.1 40mm deep repointing per linear metre. £

8.2 Deep packing per linear metre £

8.3 Per 1 cubic metre stone replacement ashlar stones. £

8.4 Per 1 cubic metre stone replacement worked stone. £

IMPORTANT NOTE: THE SITE IS A GRADE II LISTED BUILDING. ANY DAMAGE DURING THE WORKS MUST BE REPORTED IMMEDIATELY TO THE ARCHITECT/ EMPLOYER.

TENDER SUMMARY

PART 1	**PRELIMINARIES**	£
PART 2	**PREAMBLES/ SPECIFICATION**	**-**
PART 3	**SCHEDULE OF WORKS**	
1.	Demolitions and Preparatory Works	£
2.	Repairs to base plinth- Step 1	£
3.	Repairs to base plinth- Step 2	£
4.	Repairs to base plinth- Step 2	£
5.	Top Cross repairs/ protection works	£
6.	Paving works	£
7.	Contingency Sum (15% of total amount 1-6)	£

TOTAL TO FORM OF TENDER: **£** _____