

**A: Wall-top Capping - stone slabs**

The approach to capping the horizontal surfaces of the wall tops with stone slabs has been carried out on the Ambulatory structure at Neath Abbey. The works were undertaken by Cadwraeth and sets the benchmark of quality standard. Below sets out the methodology for carrying out the stone slab capping to the high level horizontal surfaces.

- All existing stone coping is to be taken down to existing face-work level. All voids formed as a result of stone removal must be well cleaned of all loose mortar, debris and vegetation prior to reinstatement of masonry. Indicative levels of coursed rebuilding has been noted on each elevation.
- The top course of face-work is to be at least 250mm deep from finished face, laid with a slight fall to the external face.
- The top course should be re-laid to a fall, using larger (wider) stones where necessary to reduce the number of joints, thereby reducing opportunities for water penetration and resultant vegetation growth.
- Clean off exposed surface areas, removing dust and debris to ensure that good adhesion is obtained between the new mortar and sound surfaces of existing and new masonry.
- All vegetation to be removed, including root system. Significant root systems have been noted on each of the elevations.
- Stone must be cleaned of existing mortar and debris, prior to re-bedding, taking care not to damage stone during cleaning.
- Wall tops to be recapped using 50mm thick Pennant stone slabs cut to suit, and laid to a slight fall. Sizes to be dictated by manual handling and material availability, but to minimise the number of joints where possible. Slabs to be laid 50mm back from finished face of top course to reduce visibility or impact from ground level.
- Prior to re-fixing of capping, slabs are to be laid out 'dry' for inspection and agreement.
- Dampen stone prior to re-bedding.
- Slabs will be clamped into position using stainless steel fixtures (or similar).
- Where wall finish levels change, an overlap of the slabs of 150mm (min) is to be incorporated to allow water runoff and ensure weather protection at abutments.

Exposed edges of stone slabs are to be tooled to match the details as created in phase 1 and 2.

Mortar is to be a 3:1 lime mortar mix using NHL 5 (which has been trialled elsewhere on site).

The type of masonry is a grey-brown Pennant sandstone, that is of moderate condition that displays some surface losses. The exposure for the mortar will be very exposed which will be subject to high winds and driving rain. There are quality approved samples available to be viewed at Neath Abbey that have been created by Cadwraeth. All mortar works are to be benchmarked against this sample, matching colour, aggregate size

**B: Wall Capping - mortar works (wall-tops and masonry tears)**

This work covers the consolidation and repair of all wall heads that do not have a horizontal wall surface and cannot accommodate a stone slab as noted in repair type A. The capping work is to ensure structural stability and effective run-off of rainwater. It also includes the works to the exposed vertical wall cores. It includes for:

- Localised dismantling and reconstruction of masonry where stones are loose or there has been disruption to sections of stonework through factors such as vegetation growth or structural movement;
- Removal of existing capping/pointing;
- Replacement capping
- Filling of voids
- Repointing

Areas marked on the drawings will require some or all the above.

**Dismantling & reconstruction:**

- B1: Carefully record area using digital images;
- B2: After noting the location of each individual stone, remove the stone, mark on the underside with was crayon and set aside;
- B3: Clean all debris (including root system) from underlying area;
- B4: Reinstall all removed masonry elements in their original positions using a lime bedding mortar.
- B5: Once the stones are set in the correct locations, allow the mortar to set in controlled conditions.

**Removal of existing capping/pointing:**

- B6: Identify and remove all areas of deteriorated or hollow capping;
- B7: Remove any loose or deteriorate pointing;
- B8: Excavate any cracks (whether between mortar and stone or in the capping mortar) to provide a joint of minimum depth 20mm and width 10mm;
- B9: Remove and areas of pointing (particularly at front edge) or capping that are preventing effective run-off of rainwater).

**Replacement of Capping:**

- B10: Place a new capping mortar (see ???) into all excavated cracks; mortar should be allowed to set in controlled conditions and finished to match adjacent mortar;
- B11: In conjunction with architect, review which areas of capping require replacement;
- B12: Subject to the results of B10, allow to replace all areas of removed capping. Apply new mortar to a fall and ensure that there are no traps of water. Avoid any feather edges;

B13: Apply mortar to a pre-wetter substrate and allow to set under controlled conditions including protecting from wind and rain and keeping the area damp for a minimum of 48 hours.

**Filling of voids:**

- B14: Thoroughly flush out voids with clean water;
- B15: Pre-wet void and pack with lime capping mortar (see ???). Ensure that mortar is well compacted and completely fills the void;
- B16: If the void exceeds 25mm in any one direction, then add small stones (<15mm) to mortar to provide additional strength and reduce shrinkage;
- B17: If the void exceeds 150mm in any one direction, apply mortar to void and then insert suitably sized piece of stone. This should be pre-wetted and pushed into the mortar until firmly bedded. The insertion of additional material should be recorded;
- B18: Allow mortar to set under controlled conditions including protecting from wind and rain and keeping the area damp for a minimum period of 48 hours.

All areas of vertical core-work are to be carefully brushed down, including remains of buttresses to remove dirt, debris and loose fragments. All vegetation to be treated, removed and voids exposed. Assessment of extent of pointing, filleting and support to be quantified on completion. Allowances for assumed extent has been outlined on the drawings.

**Da: Repointing to Random Coursed Pennant Stone Walls**

Joints in the wall have mostly been repointed previously. This has generally survived well but there are many cracked areas and also areas where (particularly at low level) the mortar has washed out.

- D1: Where joints have cracked or deteriorated, remove mortar to sound surface or to a minimum depth of 30mm. Use only hand tools such as sharp chisels or quirks
- D2: Brush away all loose dust and debris from the joint and soak the surface with clean water
- D3: While the substrate remains damp, apply new pointing mortar (see 'Materials') flush with the face of the adjacent stone
- D4: Ensure firm compaction of pointing and allow the mortar to go 'leather hard'
- D5: Using a small pointing trowel, scrape back mortar surface to reveal the aggregate and to leave the mortar slightly recessed from the front
- D6: Avoid smearing mortar over edges of stones adjacent to the joint
- D7: Allow mortar to set under controlled conditions including protecting from wind and rain and keeping the area damp for a minimum period of 48 hours.

Allow for attendance of architect during the survey of stonework to schedule repairs and replacement

**Db: Works to Ashlar Dressings**

Allow for attendance of architect during the survey of stonework to schedule repairs and replacement. General allowances have been prepared for tender process. General scope will be to ensure that all dressed stone is safe and secure and that all joints are repointed.

**E: Removal of plant growths from masonry**

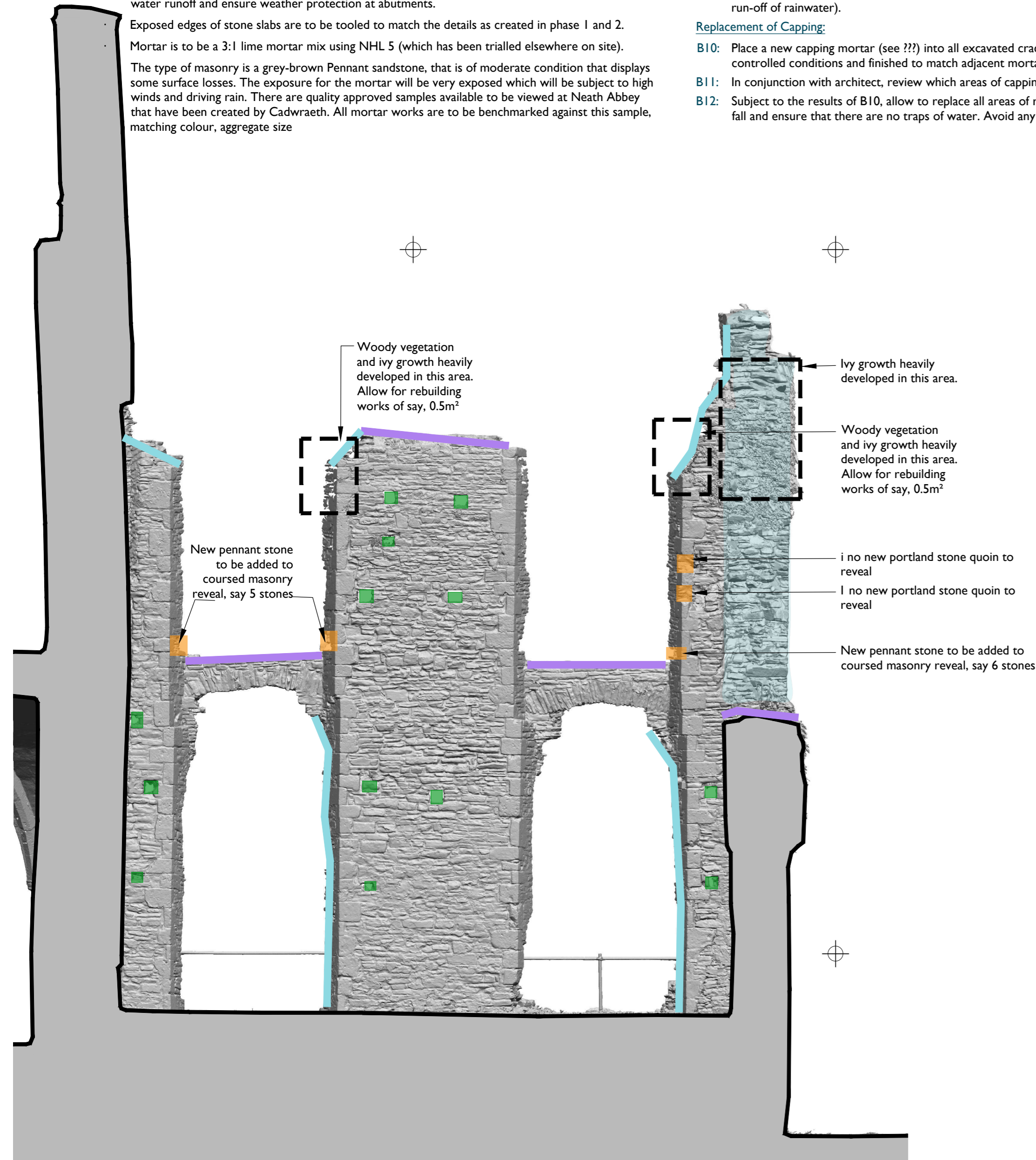
Carefully remove from joints, voids and face-work all plants, root systems and associated soil/debris. Where root growths cannot be removed completely without disturbing masonry seek instructions from the Contract Administrator. Allow for the works to cut through the stem as close to the root as possible, remove bark from the stump and apply herbicide paste. Leave stump to wither, followed by removal. Allowances have been outlined below. Areas of significant plant growth have been highlighted, which are in addition to the allowances as some areas of rebuilding may be required - this is to be allowed for.

**SPOT ITEMS:**

- Stone Inserts as per NBS Specification to be bedded in to opening.
- Stone Inserts as per NBS Specification to be bedded in to existing putlog holes. New stones are to be chamfered towards the bottom external face to enable effective rainwater run-off, with a tooled surface to match those that have previously been inserted in the phase 1 and 2 conservation works..
- Consolidation and stabilisation to historic plaster. Refer to NBS Specification.
- Allow for slate packing above all lintels and repointing to stonework above lintels and below relieving arch

**NOTES:**

- Historic plasterwork/render: take care around the elevations where historic plasterwork and/or render is present. This is to be fully retained. Seek Contract Administrators advice if required.

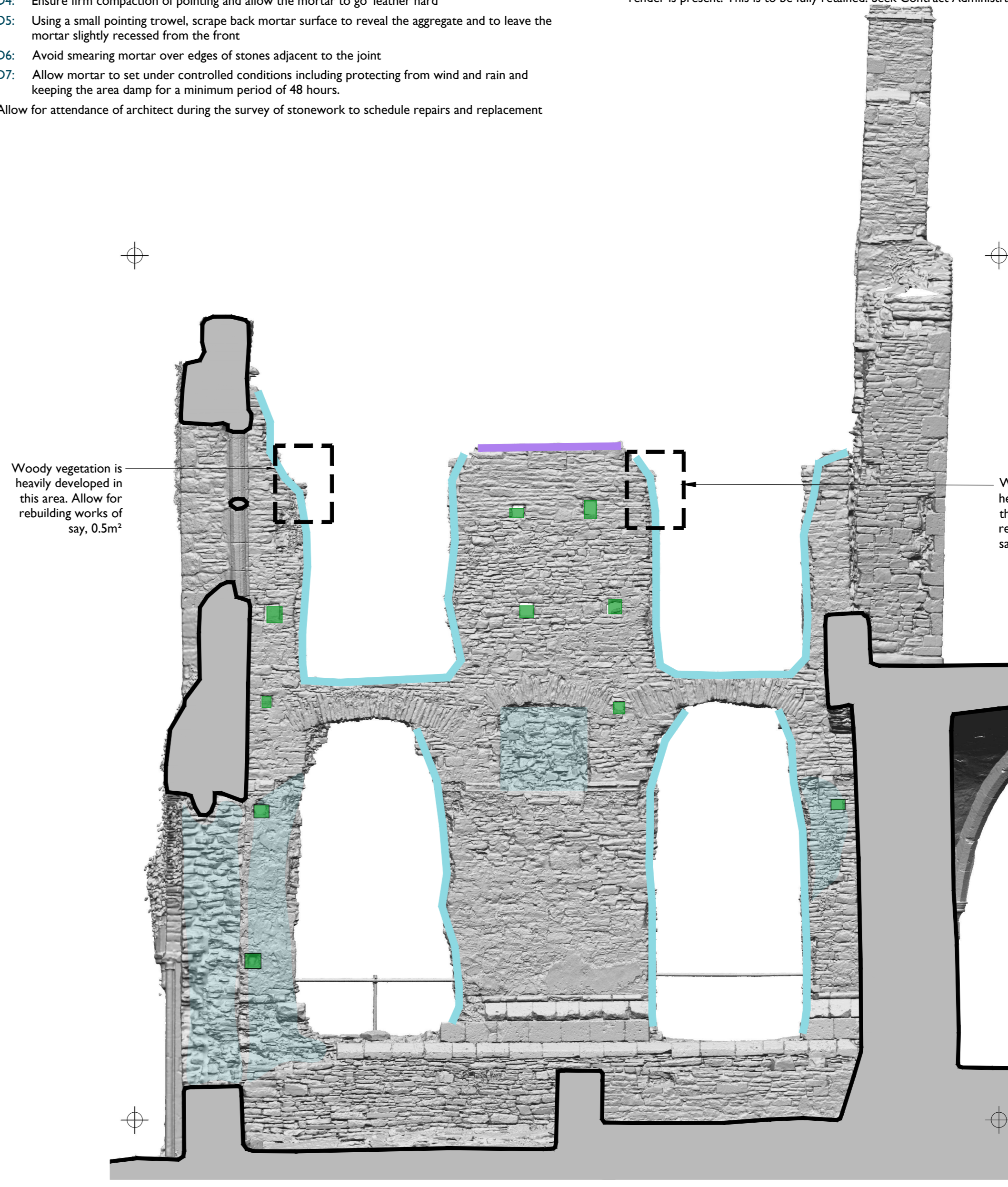


1 Elevation 1.2.3 (South face)  
211 1:50

**QUANTITY OF WORK - ELEVATION 1.2.3**

- A: Wall capping - stone slabs = As indicated
- B: Wall capping - mortar works = As indicated
- Da: Repointing to random coursed pennant stone = 75%
- Db: Repointing to dressed ashlar stone = 100% ; Dowel pinning = Allow 25 dowels
- E: Removal of vegetation = As indicated

Elevation approximately measures 45m²



2 Elevation 1.2.5 (North face)  
211 1:50

**QUANTITY OF WORK - ELEVATION 1.2.5**

- A: Wall capping - stone slabs = As indicated
- B: Wall capping - mortar works = As indicated
- Da: Repointing to random coursed pennant stone = 100%
- Db: Repointing to dressed ashlar stone = 100% ; Dowel pinning = Allow 30 dowels
- E: Removal of vegetation = As indicated

Elevation approximately measures 45m²

<p>Notes:</p> <p>Drawings are based on survey data and may not accurately represent what is physically present.</p> <p>Do not scale from this drawing. All dimensions are to be verified on site before proceeding with the work.</p> <p>All dimensions are in millimeters unless noted otherwise.</p> <p>Purcell shall be notified in writing of any discrepancies.</p>	<table border="1"> <tr> <td>A</td> <td>07/01/2020</td> <td>AN</td> <td>Contract issue</td> </tr> <tr> <td>First Issue</td> <td>20/04/18</td> <td>AN</td> <td>-</td> </tr> <tr> <td>ISSUE</td> <td>DATE</td> <td>DRAWN</td> <td>CHECKED</td> <td>DESCRIPTION</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>DRAWING STATUS CONTRACT</td> </tr> </table>	A	07/01/2020	AN	Contract issue	First Issue	20/04/18	AN	-	ISSUE	DATE	DRAWN	CHECKED	DESCRIPTION					DRAWING STATUS CONTRACT	<p>CLIENT Cadw Welsh Government's historic environment service</p> <p>PROJECT Neath Abbey - Tudor Mansion House Phase 3</p>	<p>DRAWING TITLE INTERNAL COURTYARD Survey elevations 1.2.3 AND 1.2.5</p> <p>SIZE &amp; SCALE A1 at 1:50</p>	<p>JOB NUMBER 237495/04</p> <p>DRAWING NO. 211</p> <p>REVISION A</p>	
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