

URQUHART CASTLE
GRANT TOWER
BEAM REPLACEMENT AND HIGH LEVEL MASONRY CONSOLIDATION

For locations and extent of the following work please refer to drawing 485-309- 342 attached.

High Level Masonry Consolidation

Remove all plant growth including roots. Moss build up is to be removed with timber scrapers

Using hand tools only; rake, tamp and point wall heads and wall faces removing all cement based mortar whether failed or not. Any original historic lime based mortar and traces of harl on stone faces is to be retained.

Mortar specification for Mass Walling:

Lime type:	Natural Hydraulic Lime
Strength:	NHL 5
Make:	Otterbein
Mix ratio:	1 part lime to 2.5 parts aggregate
Aggregate:	1.5 part Cloddach sand, 0.5 part Shell Sand, 0.5 part grit (4-6mm)
Style:	Flush, aris to aris, without slaistering onto face of stones.
Finish:	Washed to bring up aggregate

Mortar specification for Fine Joints:

Lime type:	Natural Hydraulic Lime
Strength:	NHL 5
Make:	Otterbein
Mix ratio:	1 part lime to 2 parts aggregate
Aggregate:	1.5 part Cloddach sand and 0.5 part Shell Sand. Both sands passed through a 3mm sieve using only the sand which passes through.
Style:	Flush, aris to aris, joints to be taped to prevent slaistering onto face of stones.

Finish: Washed to bring up aggregate

Mortar specification for Deep Tamping:

Lime type: Natural Hydraulic Lime

Strength: NHL 5

Make: Otterbein

Mix ratio: 1 part lime to 3 parts aggregate

Aggregate: 1 part Clodoch building sand, 2 parts Shell Sand

A sample panel employing the above specifications is to be done and this is to be outlined in chalk, maintained throughout the works and used continuously as an exemplar to which all the other pointing must match.

Minor Lower Level Masonry Consolidation

At area of failed pointing, using hand tools only; carry out a rake tamp and point removing all cement based mortar whether failed or not. Any original historic lime based mortar is to be retained. Lost pinings are to be reinstated.

Pointing and tamping mix to match that employed for high level masonry.

Minor High Level Modern Lead Replacement

Replace, with like for like arrangement, weathered lead chutes and spouts within the wallhead employing Code 8 lead, with a patination oil finish, laid on needle punched woven felt.

Modern Corroded Beam Replacement

Replacement sequence:

1. Fit across temporary propping, bearing on timber spreader plates, to support the underside of arched chamber roof.
2. With hand tools, cut out facing pinings from tower wall interior face that cover the ends of the existing corroded beams and set aside the pinings for reuse. (These are the pinings built into the hole which was made in the wall when the existing beams were inserted)
3. Cut out mortar packing between top of existing beams and underside of chamber roof.

4. Pull out first corroded beam and slide in new stainless steel replacement beam.
5. Pack out gap between top of new beam and underside of chamber roof with slate set in NHL 5 based mortar and leave to set.
6. Upon setting of first beam packing mortar repeat actions 4 and 5 for remaining beam.
7. Upon setting of second beam packing reinstate cover pinings at beam ends to tower wall interior face.
8. Remove acrow prop temporary propping.

Replacement Stainless Steel Beam Specification:

Profile:	RHS 120x100x8
Steel Type:	Stainless Steel Grade 316L. Execution Class EX1.
Finish:	Keyed and painted with primer and two pack epoxy colour green/grey12B24
Packing:	Slate set in NHL 5 based mortar to match mortar used for Mass Walling consolidation as specified above.
Temporary Props:	3 no Type 1 Acrow props per beam, with 2 no 75x200 C16 timber spreader beams below.

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