

**Condition 4:**

*"No repointing works shall take place until a detail repointing scheme and method statement has been submitted to and approved in writing by the Local Planning Authority. The scheme shall be carried out in strict accordance with the approved details."*



Existing random coursed gritstone walls with cement strap pointing.

**Detail Re-pointing Scheme**

A Sample of existing lime mortar has been analysed by Mark Womersely [www.mwomersleys.co.uk](http://www.mwomersleys.co.uk) in order to determine the correct mortar match for the listed building.

Please find below the mortar analysis report on the following pages:

**MORTAR ANALYSIS REPORT** Page 1 of 4

|                                                  |                                |
|--------------------------------------------------|--------------------------------|
| ANALYSIS DATE                                    | January 2025                   |
| SITE                                             | The Old School House, Hayfield |
| CLIENT                                           | Andy Sharp – ref. Saddleworth  |
| DATE/ TAKEN<br>RECEIVED                          | January 2025                   |
| CLIENT<br>REQUIREMENTS                           | Analyse mortar sample          |
| LOCATION/<br>FUNCTION IN<br>BUILDING             | Pointing / bedding mortar.     |
| CONDITION OF<br>SAMPLE<br>RECEIVED/<br>COLLECTED | Bound mortar                   |

**GENERAL COMMENTS/ SUMMARY**

The nature of the binding matrix of the mortar sample and information gained from the analysis suggest that the mortar was probably made by volume from 2 parts hydrated lime, including a lot of inert lime, 1-part early natural cement, and 3 parts fine quartz-based sand. The ash in the mortar comes from the lime and cement production process.

**SUGGESTED REPLACEMENT MORTAR**

1-part Ionic Old White NHL3.5 to 2 ½ parts Nosterfield Sand.

**ANALYTICAL PROCEDURES**

The selected material sample was dried, weighed, and examined both by eye and under a binocular microscope at x 20 and x 35 magnification. The sample was crushed, and the binder was separated from the aggregate by dissolution in dilute hydrochloric acid. The relative proportions of binder (lime, cement, and gypsum) to aggregate were determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken utilising sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received. Assuming that the sample was generally representative of the mortar, the analysis will give a reasonable indication of the original materials and provide a basis for the specification of repair or replacement mortars.

More sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition if more detailed information is required (for example, for historical research purposes).

**MORTAR EXAMINATION AND ANALYSIS**

| PROCEDURE                                                      | DESCRIPTION / COMMENTS                                                                                           |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| PRELIMINARY EXAMINATION OF SAMPLE BY EYE                       | A fine-grained dusty dirty light-grey-coloured mortar with visible lime inclusions.                              |
| EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG | The fine-grained binder-rich mortar has an open texture. The rich, cream binder contains quartz and clinker ash. |

***ACID DISSOLUTION***

| PROCEDURE                       | DESCRIPTION ~ COMMENTS                                                                        |
|---------------------------------|-----------------------------------------------------------------------------------------------|
| 10% HCL ACID DISSOLUTION        | It is relatively easy to crush. There was a vigorous and prolonged reaction upon dissolution. |
| FILTER GRADE (PORE SIZE) & TYPE | Whatman Type 1                                                                                |

***AGGREGATE SEPARATION***

| BS SIEVE Mesh Size                 | Residue Retained in g's | Undissolved binder % | Aggregate excluding undissolved binder – gs* | Aggregate weight % | Comments                                                                    |
|------------------------------------|-------------------------|----------------------|----------------------------------------------|--------------------|-----------------------------------------------------------------------------|
| 4.75 mm                            | 0                       |                      |                                              |                    |                                                                             |
| 2.36 mm                            | 0.58                    | 20                   | 0.46                                         | 2.5                | Clear, pink and iron-stained quartz and clinker.                            |
| 1.18 mm                            | 1.41                    | 15                   | 1.20                                         | 7                  | Clear, pink and iron-stained quartz and clinker.                            |
| 0.60 mm (600 µm)                   | 5.42                    | 20                   | 4.34                                         | 24.5               | Clear and iron-stained quartz and clinker.                                  |
| 300 µm                             | 10.91                   | 3                    | 10.58                                        | 60                 | Clear, pink and iron-stained quartz and clinker.                            |
| 150 µm                             | 1.95                    | 50                   | 0.98                                         | 5.5                | Clear and iron-stained quartz and clinker. Alite and Belite binder residue. |
| < 150 µm, including filter residue | 3.00                    | 97                   | 0.09                                         | 0.5                | Clinker ash. Belite binder residue.                                         |

The quartz aggregate is all sub-rounded

\*The aggregate weight is a proportion of the combined weight of lime and aggregate, the lime being lighter.

**AGGREGATE CHARACTERISTICS**

The primary aggregate is quartz sand and inert lime.

Because sand and gravel aggregates are ultimately derived from the weathering of solid rock, most aggregates contain coarse-grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays that may be washed away. Both processes eventually result in quartz-rich sand.

**CONSTITUENTS OF ANALYSIS SAMPLE**

| <b>MATERIAL</b>                                    | <b>WEIGHT (g)</b> | <b>COMMENTS</b> |
|----------------------------------------------------|-------------------|-----------------|
| <b>A:</b> DRY WEIGHT OF-<br>ANALYSIS SAMPLE        | 31.56             |                 |
| <b>B:</b> DRY WEIGHT OF ALL<br>INSOLUBLE           | 23.27             |                 |
| <b>C:</b> DRY WEIGHT OF<br>INSOLUBLE BINDER        | 5.62              |                 |
| <b>D:</b> (B-C) DRY WEIGHT OF<br>AGGREGATE         | 17.65             |                 |
| <b>E:</b> (A-B+C)) DRY WEIGHT<br>OF LIME & BINDERS | 13.91             |                 |
| <b>F:</b> DRY WEIGHT OF LIME                       | 8.29              |                 |
| OTHER                                              |                   |                 |

**PROPORTIONS OF ANALYSIS SAMPLE**

The sample proportions give aggregate and carbonated or set lime relative volumes within the weights recorded for each sieve collection.

**FREE LIME: CEMENTITIOUS BINDER: AGGREGATE**

**1.5: 1: 3.1**

**PROBABLE ORIGINAL MIX**

The nature of the binding matrix of the mortar sample and information gained from the analysis suggest that the mortar was probably made by volume from 2 parts hydrated lime, including a lot of inert lime, 1-part early natural cement, and 3 parts fine quartz-based sand. The ash in the mortar comes from the lime and cement production process.

Sample analysis, interpretation and report carried out by: Mark Womersley.  
[www.mwomersleys.co.uk](http://www.mwomersleys.co.uk)

**Detail Re-pointing Scheme****Method Statement**

All existing cement strap pointing to be raked out, removing all cement from the arris and surface of the stone. Remove all old cement mortars and open joints to minimum depth of 25mm. Loose and damaged joints to be carefully raked out manually, All loose material should be gently washed out of the joints prior to re-pointing.

Repoint joints with mortar mix specified in the mortar analysis document (1-part Ionic Old White NHL 3.5 to 2 1/2 parts Nosterfield Sand) by hand with recessed bagged brushed joints. New mortar should be rammed as far back as possible into the joint with a pointing toll and left slightly recess or flush to match existing mortar.

Work should not be carried out when there is danger of frost or heavy rain.

Repointing to be undertaken by Andy Sharp of Saddleworth Restoration Conservation Ltd, who have completed a number of projects locally.